REMARKS

The present Amendment amends claim 7 and adds new claims 8-10. Therefore, the present application has pending claims 7-10.

The specification stands objected to due to informalities noted by the Examiner in paragraph 1 of the Office Action. Particularly, the Examiner advises Applicants to update the information regarding the chain of priority of the present application. The present Amendment updates the chain of priority of the present application as requested by the Examiner. Therefore, this objection is overcome and should be withdrawn.

Additional amendments were made to the specification to correct minor errors discovered upon review.

Claim 7 stands rejected under 35 USC §103(a) as being unpatentable over Nakayama (U.S. Patent No. 6,175,746) in view of Portin (U.S. Patent No. 5,794,159). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention as now recited in claim 7 are not taught or suggested by Nakayama or Portin whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to claim 7 so as to more clearly describe features of the present invention. Particularly, amendments were made to claim 7 so as to more clearly recite that the present invention is directed to a multi-band radio terminal apparatus which includes a transmitter/receiver for processing radio communication signals of a plurality of communication frequency bands, wherein the radio

communication signals are used to communicate with a base station, a first frequency converter for frequency converting the frequency bands of the radio communication signals between the communication frequency bands and an intermediate frequency, a second frequency converter for converting the radio communication signals between base band signals and the intermediate frequency signal and a base band signal processing circuit for handling a conversion between the base band signals and audio signals.

As recited in claim 7, the second frequency converter includes a second local oscillator for producing a second local oscillator signal and a mixer for using the second local oscillator signal so as to convert a transmission base band signal into a transmission intermediate frequency signal.

Further, as recited in claim 7, the first frequency converter includes one reception-sided mixer for converting a reception signal within the communication frequency bands into another reception signal within the intermediate frequency band, one transmission-sided mixer for converting a transmission signal within the intermediate frequency band into another transmission signal within the communication frequency bands, and a first local oscillator for commonly supplying a first local oscillator signal to both the reception-sided mixer and the transmission-sided mixer. According to the present invention, the second local oscillator outputs a plurality of oscillating frequencies in response to the frequency band of the radio signal used in the communication between the base station and the multi-band radio terminal apparatus.

The above described first frequency converter includes the first local oscillator commonly supplying the first local oscillator signal to both the reception-sided mixer and the transmission-sided mixer.

These features of the present invention allows for a simplified internal structure within the multi-band radio terminal apparatus such that the number of mixers can be reduced thereby limiting the number of integrated circuits that are necessary to properly operate the multi-band terminal apparatus. Accordingly, the features of the present invention aids in accomplishing the goal of reducing the cost and size of a multi-band radio terminal apparatus. These features of the present invention are discussed, for example, on page 3, lines 9-13, page 18, lines 2-9 and page 24, lines 14-22 and illustrated, for example, in Fig. 1 as elements 13 and 33, and 3, 15, 19 and 20

As is well understood by those of ordinary skill in the art, reducing the number of internal parts thereby reducing cost and size of a multi-band radio terminal apparatus is extremely important since such devices must be inexpensive, portable, light-weight and easy to use. The present invention as recited in the claim further these goals.

The above described features of the present invention are not taught or suggested by any of the references of record particularly Nakayama and Portin whether taken individually or in combination with each other as suggested by the Examiner.

Nakayama teaches a multi-band mobile unit having a plurality of first receiving mixers 21, 22 and 23 each of which is used to receive and mix a signal of a different

frequency band. Each of the first receiving mixers 21, 22 and 23 based on an oscillating signal from the frequency synthesizer 18 causes the mixers 21, 22 and 23 to produce an intermediate frequency corresponding to the frequency band of the reception frequency.

Further, as taught by Nakayama subsequent to the first receiving mixers 21, 22 and 23 a quadrature demodulator 28 is provided having a plurality of second receiving mixers 28a and 28b so as to converter the intermediate frequency signal into I and Q demodulation signals.

Thus, as can be seen from the above, structurally Nakayama teaches apparatus entirely different from that of the present invention as recited in the claims. As described above, the present invention is intended to reduce the number of receiving mixers. As is quite clear from Figs. 1 and 2 of Nakayama, a plurality of receiving mixers 21, 22 and 23 are provided each servicing a different frequency band. The present invention as clearly recited in the claims provides one reception-sided mixer, thereby reducing the number of receiving mixers.

Further, as recited in the claims the reception-sided mixer and the transmission-sided mixer are commonly provided with a first oscillating signal from a first local oscillator. Thus, as per the present invention the same oscillating signal is provided to both mixers, thereby simplifying the internal circuitry of the apparatus and allowing for the use of one mixer on each receiving and transmission sides. Such features are clearly not taught or suggested by Nakayama.

Therefore, based on the above It is quite clear that the apparatus taught by Nakayama with the plurality of receiving side mixers is not equivalent to the features

of the present invention as recited in the claims, nor does the apparatus taught by Nakayama address the problems to which the present invention is intended, namely to reduce and simplify the number of parts contained within a multi-band radio terminal apparatus.

As recognized by the Examiner, there is no teaching or suggestion in Nakayama of a second frequency converter having a second local oscillator and a mixer for using the second local oscillator, wherein the second local oscillator outputs a plurality of oscillating frequencies in response to the frequency band of the radio signal used in the communication between the base station and the terminal as recited in the claims. Such a second local oscillator as recited in the claims is clearly not taught or suggested by Nakayama as admitted by the Examiner in the first full paragraph on page 3 of the Office Action.

The Examiner attempts to supply the above noted acknowledge deficiency of Nakayama by combining Nakayama with Portin. However the above noted deficiencies of Nakayama are not supplied by any of the other references of record particularly Portin. Therefore, combining the teachings of Nakayama and Portin as suggested by the Examiner still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Portin simply discloses a multi-mode radio telephone, which again the same as Nakayama, includes a plurality of first receiving mixers 34 and 34a each servicing a different frequency band. As clearly recited in the claims, one reception-sided mixer is provided and the one reception-sided mixer operates based on an oscillating signal provided by a first oscillator wherein the oscillating signal is commonly

supplied to the one transmission-sided mixer. Further, contrary to the specific limitations in the claims Portin teaches a plurality of transmission-sided mixers 44a and 44 each servicing a different frequency band. The claims recite one transmission-sided mixer.

Even beyond the above, the Examiner relies on Portin for an alleged teaching of the use of a switch for selectively supplying a plurality of oscillating signals to a mixer included within the second frequency converter. The Examiner alleges that this feature of the present invention is taught by element 38 in Fig. 3 of Portin. However, the switch 38 as taught by Portin simply provides one of the local oscillating signals LO_1, LO_2 to the plural mixers 34 and 34a on the reception side and the plural mixers 44a and 44 on the transmission side. As per Portin the plural mixers 34 and 34a on the reception side converts the reception signals into and intermediate frequency signal. Thus, in Portin after the plural mixers 34 and 34a on the reception side a further conversion by another converter including a mixer must be performed.

According to the present invention, the mixer to which the second oscillator signal is provided forms part of the second frequency converter which converts the radio communication signals between base band signals and an intermediate signal not the mixers of the first frequency converter which converts the frequency bands of the radio communication signals between the communication frequency bands and an intermediate frequency. The mixers 34 and 34a of Portin are intended to convert the frequency bands of radio communication signals between communication frequency bands and an intermediate frequency band.

Thus, the switch 38 as taught by Portin does not supply a plurality of oscillating frequencies in response to the frequency band of the radio signal used in the communication between the base station and the multi-band radio terminal apparatus to the second frequency converter which converts the radio communication signals between base band signals and the intermediate frequency signal and a base band signal processing circuit for handling a conversion between the base band signals and audio signals as recited in the claims.

Therefore, Portin does not supply any of the deficiencies noted above with respect to Nakayama. Accordingly, the combination of Nakayama and Portin still fails to teach or suggest the features of the present invention as now more clearly recited in the claims.

Based on the above, Applicants respectfully request the Examiner reconsider and withdraw the 35 USC §103(a) rejection of claim 7 as being unpatentable over Nakayama and Portin.

As indicated above, the present Amendment adds new claims 8-10. New claim 8 depends from claim 7 and new claim 10 depends on claim 9. New claim 9 recites many of the same features recited in claim 7 shown above not taught or suggested by any of the references of record, particularly Nakayama and Portin. Therefore, the same arguments presented above with respect to claim 7 apply as well to new claims 8-10.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claim 7.

In view of the foregoing amendments and remarks, Applicants submit that claims 7-10 are in condition for allowance. Accordingly, early allowance of claims 7-10 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (500.36977CX1).

Respectfully submitted,

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